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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,815	11/22/2002	Ivett Alejandra Leyva	125466	9641

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH CENTER
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EXAMINER

MATZ, DANIEL R

ART UNIT

PAPER NUMBER

3641

DATE MAILED: 08/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Appli ation No.

10/065,815

Applicant(s)

LEYVA ET AL.

Examiner

Daniel Matz

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-- The MAILING DATE of this communication appears on the cover sheet with th correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3 and 14 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3 and 14 recite the limitation "'rear pulse detonation engines" in line 2. There is insufficient antecedent basis for this limitation in the claim, as claim 1 recites only "pulse detonation engines".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6, 8-18, 20- 23, 25-29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,505,443 granted to Bradfield et al. in view of USPN 6,439,503 granted to Winfree et al.

Regarding claims 1 and 21, Bradfield et al. disclose (fig. 1) an aircraft comprising at least one airfoil (21) and a plurality of engines (29, 30) distributed along and beneath the leading and trailing edge of the airfoil, and at least one engine is moveably configured for altering a direction of the thrust force relative to the airfoil (through flap

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assembly 39). Bradfield et al. do not disclose the use of pulse detonation engines (PDE's). Winfree et al. teach the use of a plurality of PDE's with the claimed features in order to provide thrust for an aircraft (fig. 4). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the use of PDE's into the aircraft of Bradfield et al. as an art recognized alternative means of providing thrust.

Regarding claim 2, the engines of Bradfield et al. are distributed along the leading edge of the airfoil.

Regarding claim 3, as best understood, the claim limitations are met by Bradfield et al. in view of Winfree et al. as discussed above regarding claim 1.

Regarding claims 4, 5 and 22, Bradfield et al. disclose an aircraft wherein each engine is moveably configured for altering a direction of the thrust force relative to the airfoil through the flap assembly (39), and thus meets the limitations of the "PDE flap."

Regarding claims 6 and 23, Winfree et al. disclose a cluster of PDE's that are timed (see abstract) to detonate sequentially, and thus out of phase.

Regarding claims 8-9 and 25, Winfree et al. disclose a control means for activating, timing, and coordinating a number of PDE's (col. 6, lines 28-35).

Regarding claim 10, Bradfield et al. discloses an aircraft with two airfoils (21).

Regarding claims 11 and 13, the engines of Bradfield et al. are distributed along both the leading edge and trailing edge of the airfoil.

Regarding claim 12, Winfree et al. disclose a control means for activating, timing, and coordinating a number of PDE's (col. 6, lines 28-35).

Regarding claim 14, as best understood, the claim limitations are met by Bradfield et al. in view of Winfree et al. as discussed above regarding claim 1.

Regarding claim 15, Winfree et al. disclose a control means for activating, timing, and coordinating a number of PDE's (col. 6, lines 28-35). Further, Bradfield et al. disclose an aircraft wherein each engine is moveably configured for altering a direction of the thrust force relative to the airfoil (through flap assembly 39).

Regarding claims 16 and 18, the PDE's of Winfree et al. comprise (fig. 1) an inlet, an outlet, and a body, all of which are elliptical in cross-section. Note that a circle is an ellipse with major and minor axes of equal length.

Regarding claim 17, the cross-sectional area of the PDE's of Winfree et al. increase from a smaller area at the inlet to a larger area at the outlet.

Regarding claim 20, Bradfield et al. disclose an aircraft with a plurality of separators (fig. 1, item 25) extending from and beneath the airfoil, in intimate contact with two engines.

Regarding claim 26, the airfoil, engines, and configuration for altering a direction of the thrust force are addressed above regarding claim 1. In addition, Winfree et al. disclose a control means for activating, timing, and coordinating a number of PDE's (col. 6, lines 28-35).

Regarding claim 27, Bradfield et al. disclose an aircraft wherein each engine is moveably configured for altering a direction of the thrust force relative to the airfoil (through flap assembly 39). Further, Winfree et al. disclose a control means for activating, timing, and coordinating each of a number of PDE's (col. 6, lines 28-35).

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Regarding claim 28, Winfree et al. disclose a cluster of PDE's that are timed (see abstract) to detonate sequentially, and thus out of phase.

Regarding claim 29, Bradfield et al. discloses an aircraft with two airfoils (21).

Regarding claim 31, Winfree et al. disclose a cluster of PDE's (fig. 1) that share an inlet and an outlet.

5. Claims 7 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradfield et al. and Winfree et al. as applied to claims 1, 6, and 21-23 above, and further in view of USPN 5,896,742 granted to Black et al.

Regarding claims 7 and 24, Black et al. teach as well known in the art the use of connectors configured to connect turbine engine combustion chambers to facilitate cross-fire initiation between the chambers (col. 1, lines 14-20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the use of such connectors into the PDE's taught by Winfree et al.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradfield et al. and Winfree et al. as applied to claim 1 above, and further in view of USPN 5,901,550 granted to Bussing et al.

Bussing et al. teach (fig. 6) a PDE body with a cross-sectional area that decreases from the inlet (top of tube 52) to the outlet (85).

7. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bussing et al. in view of USPN 5,909,475 granted to Wells et al.

Bussing et al. disclose a detonative engine comprising a plurality of PDE's (fig. 6A, 63) arranged in a packed configuration. Bussing et al. do not disclose at least one

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hexagonal PDE and the PDE's packed in a honeycomb arrangement. Wells et al. teach (col. 6, lines 49-51) the use of hexagonal close packed arrays (honeycomb arrangements) for space efficiency. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use at least one hexagonal shape and honeycomb arrangements for the PDE's of Bussing et al. in order to save space and maximize the power density of the PDE array.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

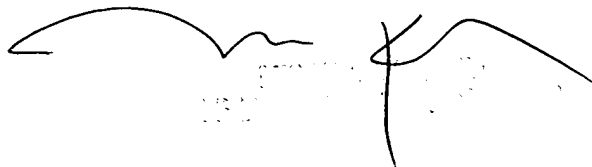
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Matz whose telephone number is (703) 306-4164. The examiner can normally be reached on Mon-Thurs, alt Fri 7:30am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-4180.

DM

August 21, 2003

A handwritten signature in black ink, appearing to read 'DMATZ', with a large, stylized flourish extending from the right side.